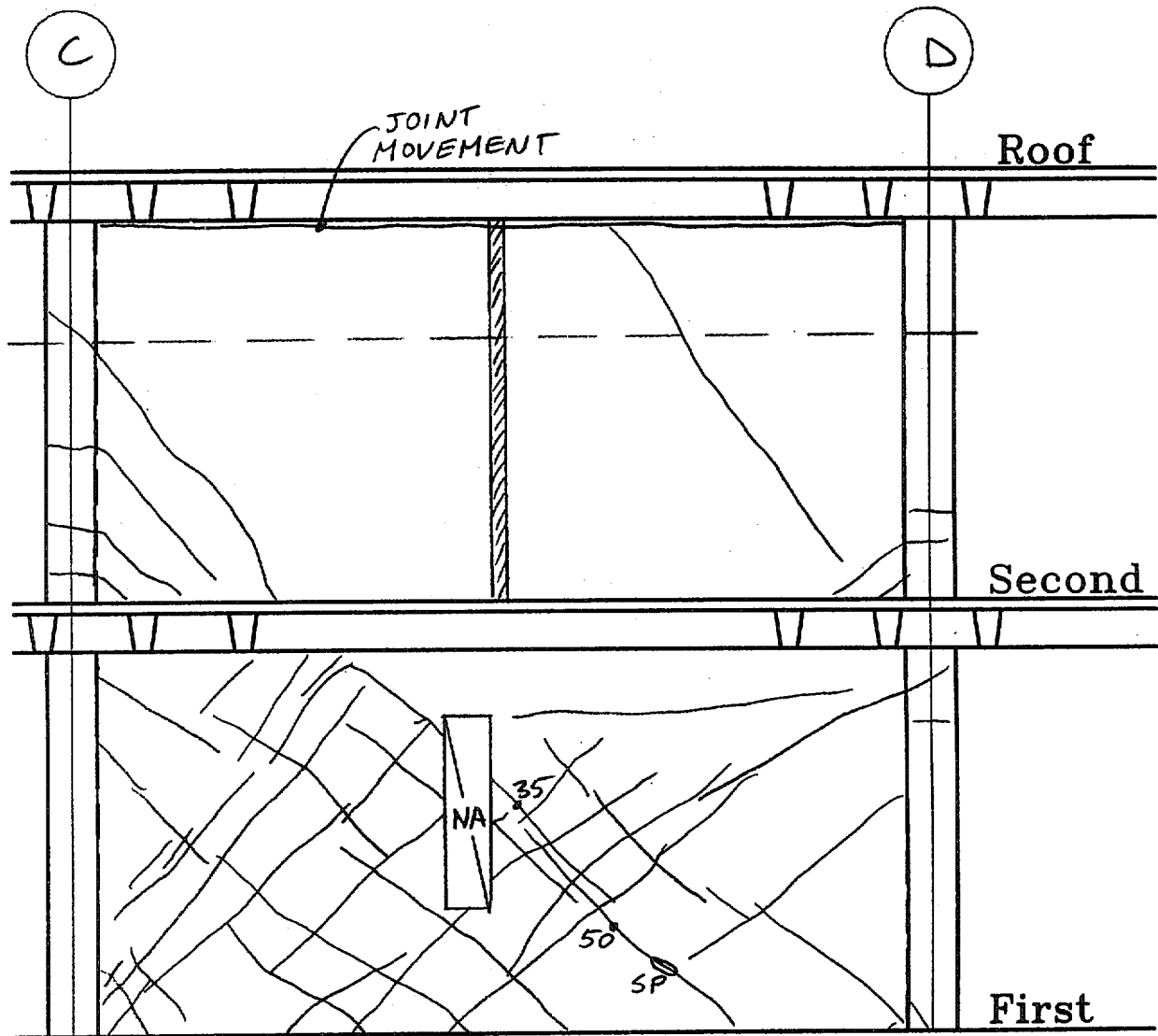


Component Damage Records for Building Evaluated in Example Application

Component Damage Record D3

Building Name: Concrete Shear Wall Building		Project ID: ATC 43 Example	Prepared by: ATC
Location Within Building: Floor: 1 st /2 nd Column Line: 7 Component Type:			Date: 24-Sep-97
Sketch and Description of Damage:			



Legend:

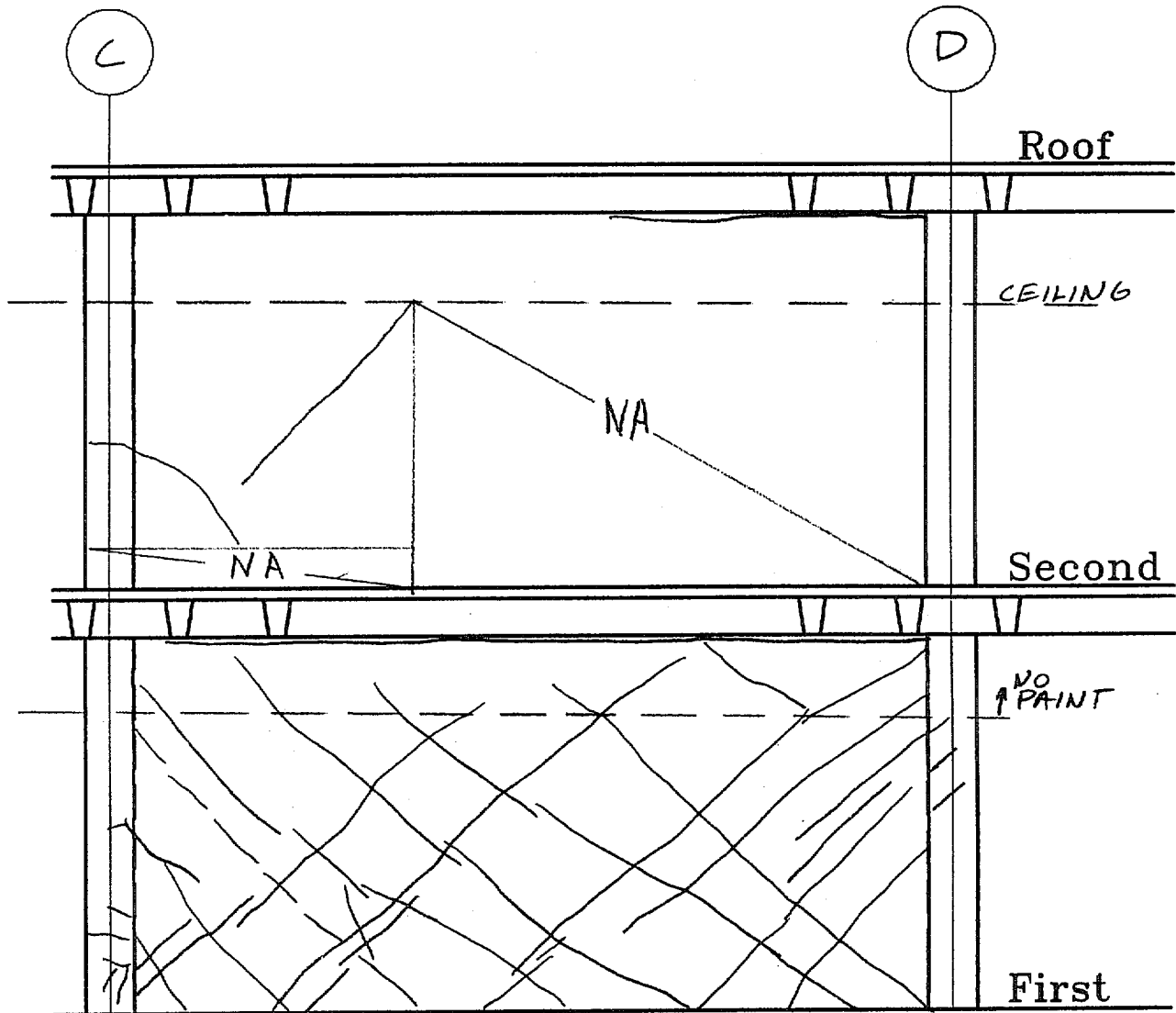
- | | | | |
|--|-------------------------------------|--|----------------|
| | Crack | | Spall |
| | Crack Width in Mills (0.001 Inch) | | Not Accessible |
| | Crack Previously Filled with Epoxy | | Partition |
| | Crack at Pre-existing Surface Patch | | |

Component Damage Record D4		
Building Name: Concrete Shear Wall Building	Project ID: ATC 43 Example	Prepared by: ATC
Location Within Building: Floor: 1 st /2 nd Column Line: 7 Component Type:		Date: 24-Sep-97
Sketch and Description of Damage:		
Legend: <div style="display: flex; justify-content: space-between;"> <div> <p>— 30 — Crack Width in Mills (0.001 Inch)</p> <p>x x x Crack Previously Filled with Epoxy</p> <p>○ ○ ○ ○ Crack at Pre-existing Surface Patch</p> </div> <div> <p>■ Spall</p> <p>NA Not Accessible</p> <p> Partition</p> </div> </div>		

Component Damage Records for Building Evaluated in Example Application

Component Damage Record D5

Building Name: Concrete Shear Wall Building		Project ID: ATC 43 Example	Prepared by: ATC
Location Within Building: Floor: 1 st /2 nd Column Line: 10 Component Type:			Date: 24-Sep-97
Sketch and Description of Damage:			



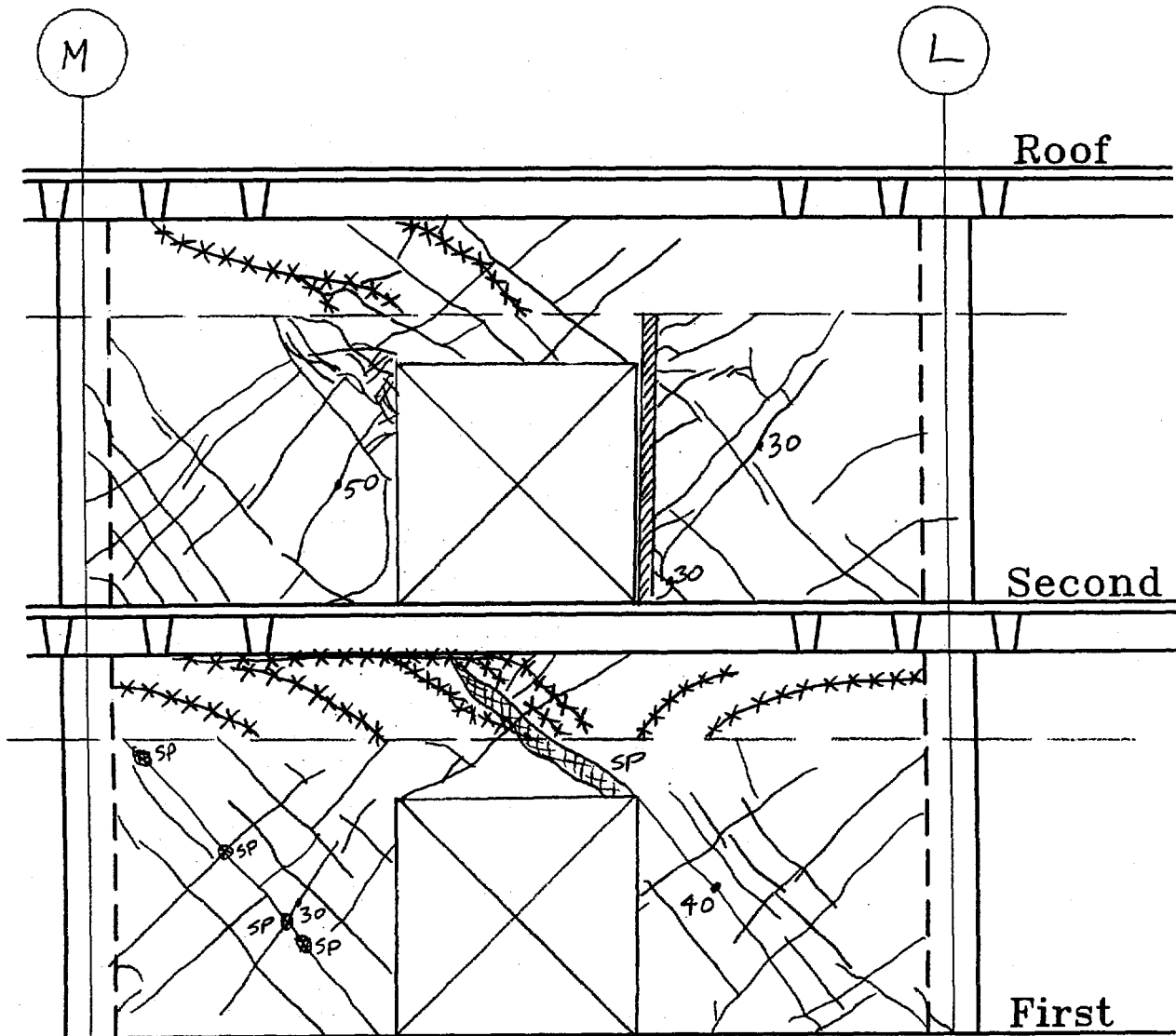
Legend:

- | | | | |
|--|-------------------------------------|--|----------------|
| | Crack | | Spall |
| | Crack Width in Mills (0.001 Inch) | | Not Accessible |
| | Crack Previously Filled with Epoxy | | Partition |
| | Crack at Pre-existing Surface Patch | | |

Component Damage Records for Building Evaluated in Example Application

Component Damage Record D6

Building Name: Concrete Shear Wall Building		Project ID: ATC 43 Example	Prepared by: ATC
Location Within Building: Floor: 1 st /2 nd Column Line: 10 Component Type:			Date: 24-Sep-97
Sketch and Description of Damage:			



Legend:

- | | | | |
|--|-------------------------------------|--|----------------|
| | Crack | | Spall |
| | Crack Width in Mills (0.001 Inch) | | Not Accessible |
| | Crack Previously Filled with Epoxy | | Partition |
| | Crack at Pre-existing Surface Patch | | |

Component Damage Records for Building Evaluated in Example Application

Component Damage Record D7			
Building Name: Concrete Shear Wall Building		Project ID: ATC 43 Example	Prepared by: ATC
Location Within Building:			Date: 24-Sep-97
Floor: 1 st /2 nd	Column Line: 15	Component Type:	
Sketch and Description of Damage:			
Legend:			
<div style="display: flex; justify-content: space-between;"> <div> Crack Width in Mils (0.001 Inch) Crack Previously Filled with Epoxy Crack at Pre-existing Surface Patch </div> <div> Spall Not Accessible Partition </div> </div>			

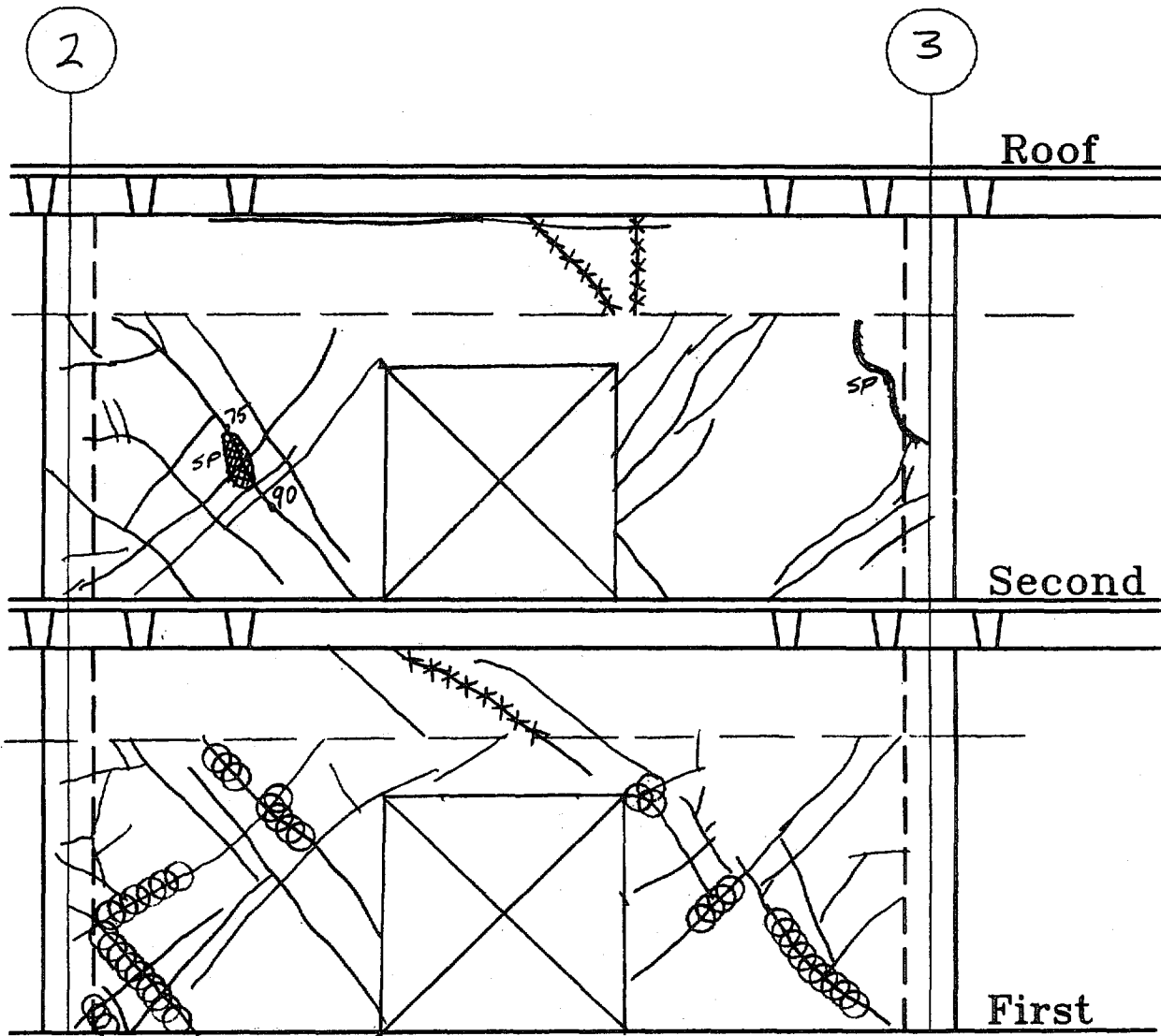
Component Damage Records for Building Evaluated in Example Application

Component Damage Record D8						
Building Name: Concrete Shear Wall Building	Project ID: ATC 43 Example	Prepared by: ATC				
Location Within Building: Floor: 1 st /2 nd Column Line: 15 Component Type:		Date: 24-Sep-97				
Sketch and Description of Damage:						
Legend: <table style="width: 100%; border: none;"> <tr> <td style="width: 33%; vertical-align: top;"> <div style="border-bottom: 1px solid black; width: 50px; margin-bottom: 5px;"></div> <div style="margin-bottom: 5px;">30</div> <div style="text-align: center;">X X</div> <div style="text-align: center;">X X</div> </td> <td style="width: 33%; vertical-align: top;"> Crack Crack Width in Mils (0.001 Inch) Crack Previously Filled with Epoxy Crack at Pre-existing Surface Patch </td> <td style="width: 33%; vertical-align: top;"> <div style="border: 1px solid black; width: 30px; height: 15px; background-color: black; margin-bottom: 5px;"></div> <div style="text-align: center;">NA</div> <div style="border-left: 2px solid black; width: 20px; height: 40px; margin-bottom: 5px;"></div> </td> <td style="width: 33%; vertical-align: top;"> Spall Not Accessible Partition </td> </tr> </table>			<div style="border-bottom: 1px solid black; width: 50px; margin-bottom: 5px;"></div> <div style="margin-bottom: 5px;">30</div> <div style="text-align: center;">X X</div> <div style="text-align: center;">X X</div>	Crack Crack Width in Mils (0.001 Inch) Crack Previously Filled with Epoxy Crack at Pre-existing Surface Patch	<div style="border: 1px solid black; width: 30px; height: 15px; background-color: black; margin-bottom: 5px;"></div> <div style="text-align: center;">NA</div> <div style="border-left: 2px solid black; width: 20px; height: 40px; margin-bottom: 5px;"></div>	Spall Not Accessible Partition
<div style="border-bottom: 1px solid black; width: 50px; margin-bottom: 5px;"></div> <div style="margin-bottom: 5px;">30</div> <div style="text-align: center;">X X</div> <div style="text-align: center;">X X</div>	Crack Crack Width in Mils (0.001 Inch) Crack Previously Filled with Epoxy Crack at Pre-existing Surface Patch	<div style="border: 1px solid black; width: 30px; height: 15px; background-color: black; margin-bottom: 5px;"></div> <div style="text-align: center;">NA</div> <div style="border-left: 2px solid black; width: 20px; height: 40px; margin-bottom: 5px;"></div>	Spall Not Accessible Partition			

Component Damage Records for Building Evaluated in Example Application

Component Damage Record D9

Building Name: Concrete Shear Wall Building		Project ID: ATC 43 Example	Prepared by: ATC
Location Within Building: Floor: 1 st /2 nd Column Line: B Component Type:			Date: 24-Sep-97
Sketch and Description of Damage:			



Legend:

- | | | | |
|--|-------------------------------------|--|----------------|
| | Crack | | Spall |
| | Crack Width in Mils (0.001 Inch) | | Not Accessible |
| | Crack Previously Filled with Epoxy | | Partition |
| | Crack at Pre-existing Surface Patch | | |

Component Damage Records for Building Evaluated in Example Application

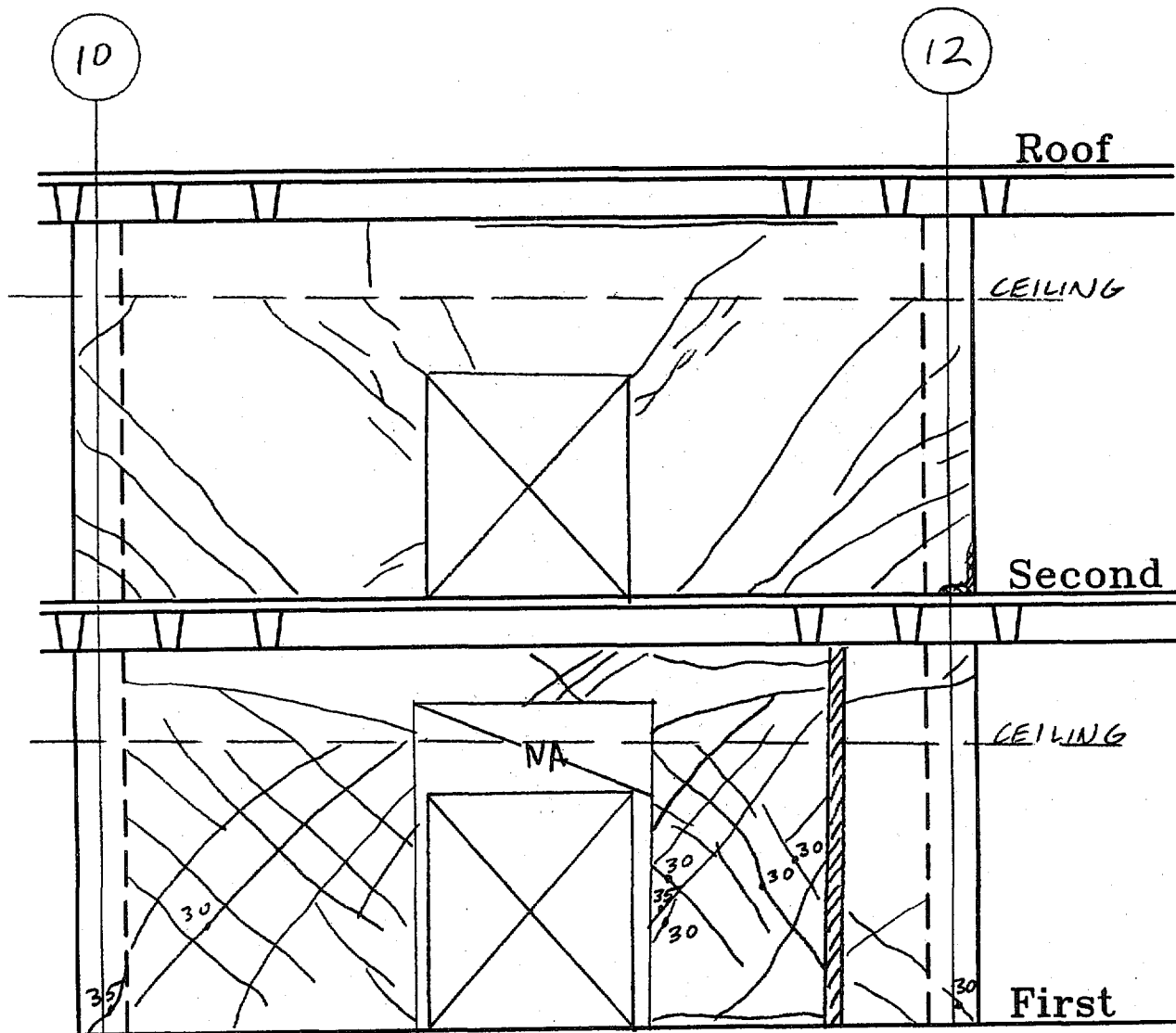
Component Damage Record D10					
Building Name: Concrete Shear Wall Building	Project ID: ATC 43 Example	Prepared by: ATC			
Location Within Building: Floor: 1 st /2 nd Column Line: B Component Type:		Date: 24-Sep-97			
Sketch and Description of Damage:					
<p>The sketch shows a cross-section of a building with three floors: Roof, Second, and First. Columns 5 and 7 are marked at the top. The Roof level shows a central column (5) with a large 'X' indicating a crack previously filled with epoxy. The Second floor shows a similar 'X' for column 5. The First floor shows a large 'X' for column 5 and a '30' indicating a crack width of 30 mils. Various other symbols like 'NA' and hatched lines are used to denote other types of damage or conditions.</p>					
Legend: <table style="width:100%; border: none;"> <tr> <td style="width: 30%; vertical-align: top;"> <div style="display: flex; align-items: center;"> <div style="border-bottom: 1px solid black; width: 50px; margin-right: 5px;"></div> <div>Crack</div> </div> <div style="display: flex; align-items: center;"> <div style="border-bottom: 1px solid black; width: 50px; margin-right: 5px; text-align: center;">30</div> <div>Crack Width in Mils (0.001 Inch)</div> </div> <div style="display: flex; align-items: center;"> <div style="text-align: center; margin-right: 5px;">X X</div> <div>Crack Previously Filled with Epoxy</div> </div> <div style="display: flex; align-items: center;"> <div style="text-align: center; margin-right: 5px;"> <div style="border: 1px solid black; border-radius: 50%; width: 15px; height: 15px; margin: 0 auto;"></div> <div style="border: 1px solid black; border-radius: 50%; width: 15px; height: 15px; margin: 0 auto;"></div> <div style="border: 1px solid black; border-radius: 50%; width: 15px; height: 15px; margin: 0 auto;"></div> </div> <div>Crack at Pre-existing Surface Patch</div> </div> </td> <td style="width: 30%; vertical-align: top;"> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="background-color: black; width: 20px; height: 10px; margin-right: 5px;"></div> <div>Spall</div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">NA</div> <div>Not Accessible</div> </div> <div style="display: flex; align-items: center;"> <div style="border-left: 2px dashed black; width: 20px; height: 30px; margin-right: 5px;"></div> <div>Partition</div> </div> </td> <td style="width: 40%;"></td> </tr> </table>			<div style="display: flex; align-items: center;"> <div style="border-bottom: 1px solid black; width: 50px; margin-right: 5px;"></div> <div>Crack</div> </div> <div style="display: flex; align-items: center;"> <div style="border-bottom: 1px solid black; width: 50px; margin-right: 5px; text-align: center;">30</div> <div>Crack Width in Mils (0.001 Inch)</div> </div> <div style="display: flex; align-items: center;"> <div style="text-align: center; margin-right: 5px;">X X</div> <div>Crack Previously Filled with Epoxy</div> </div> <div style="display: flex; align-items: center;"> <div style="text-align: center; margin-right: 5px;"> <div style="border: 1px solid black; border-radius: 50%; width: 15px; height: 15px; margin: 0 auto;"></div> <div style="border: 1px solid black; border-radius: 50%; width: 15px; height: 15px; margin: 0 auto;"></div> <div style="border: 1px solid black; border-radius: 50%; width: 15px; height: 15px; margin: 0 auto;"></div> </div> <div>Crack at Pre-existing Surface Patch</div> </div>	<div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="background-color: black; width: 20px; height: 10px; margin-right: 5px;"></div> <div>Spall</div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">NA</div> <div>Not Accessible</div> </div> <div style="display: flex; align-items: center;"> <div style="border-left: 2px dashed black; width: 20px; height: 30px; margin-right: 5px;"></div> <div>Partition</div> </div>	
<div style="display: flex; align-items: center;"> <div style="border-bottom: 1px solid black; width: 50px; margin-right: 5px;"></div> <div>Crack</div> </div> <div style="display: flex; align-items: center;"> <div style="border-bottom: 1px solid black; width: 50px; margin-right: 5px; text-align: center;">30</div> <div>Crack Width in Mils (0.001 Inch)</div> </div> <div style="display: flex; align-items: center;"> <div style="text-align: center; margin-right: 5px;">X X</div> <div>Crack Previously Filled with Epoxy</div> </div> <div style="display: flex; align-items: center;"> <div style="text-align: center; margin-right: 5px;"> <div style="border: 1px solid black; border-radius: 50%; width: 15px; height: 15px; margin: 0 auto;"></div> <div style="border: 1px solid black; border-radius: 50%; width: 15px; height: 15px; margin: 0 auto;"></div> <div style="border: 1px solid black; border-radius: 50%; width: 15px; height: 15px; margin: 0 auto;"></div> </div> <div>Crack at Pre-existing Surface Patch</div> </div>	<div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="background-color: black; width: 20px; height: 10px; margin-right: 5px;"></div> <div>Spall</div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">NA</div> <div>Not Accessible</div> </div> <div style="display: flex; align-items: center;"> <div style="border-left: 2px dashed black; width: 20px; height: 30px; margin-right: 5px;"></div> <div>Partition</div> </div>				

Component Damage Records for Building Evaluated in Example Application

Component Damage Record D11

Building Name: Concrete Shear Wall Building		Project ID: ATC 43 Example	Prepared by: ATC
Location Within Building: Floor: 1 st /2 nd Column Line: B Component Type:			Date: 24-Sep-97

Sketch and Description of Damage:



Legend:

- | | | | |
|--|-------------------------------------|--|----------------|
| | Crack | | Spall |
| | Crack Width in Mils (0.001 Inch) | | Not Accessible |
| | Crack Previously Filled with Epoxy | | Partition |
| | Crack at Pre-existing Surface Patch | | |

Component Damage Records for Building Evaluated in Example Application

Component Damage Record D12

Building Name:

Concrete Shear Wall Building

Project ID:

ATC 43 Example

Prepared by:

ATC

Location Within Building:

Floor: 1st/2nd

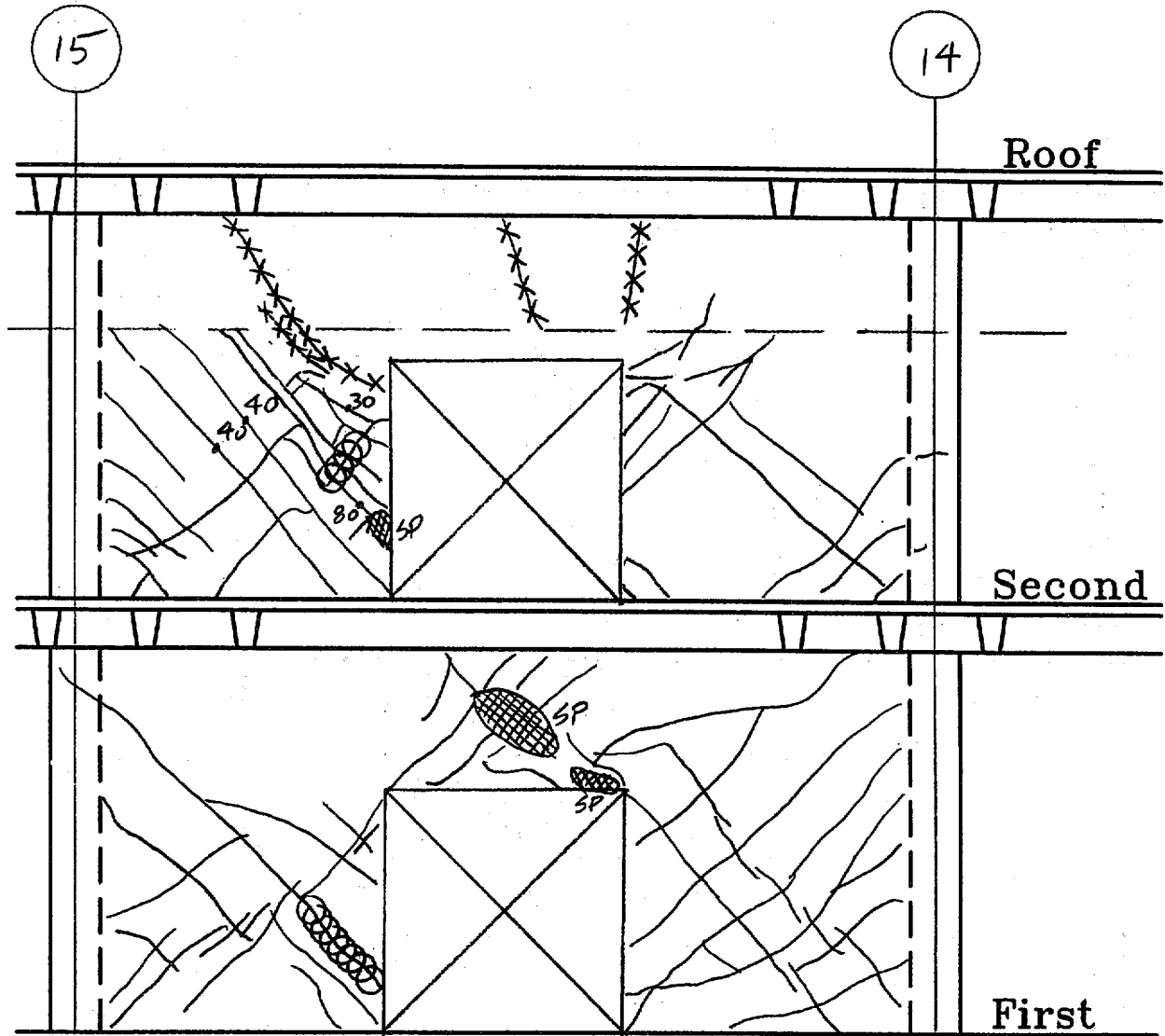
Column Line: B

Component Type:

Date:

24-Sep-97

Sketch and Description of Damage:

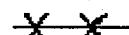


Legend:



Crack

Crack Width in Mils (0.001 Inch)



Crack Previously Filled with Epoxy



Crack at Pre-existing Surface Patch



Spall

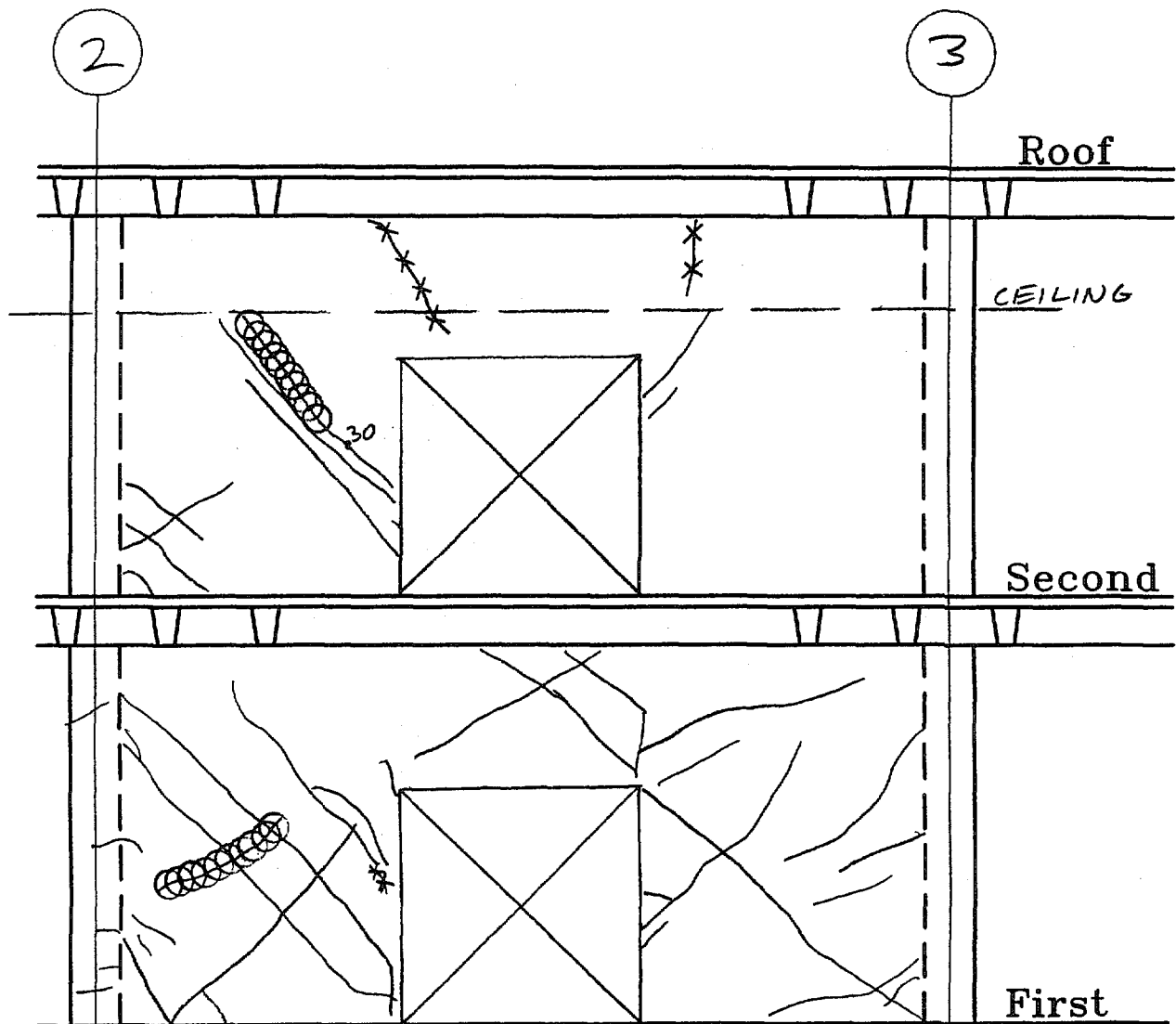
Not Accessible

Partition

Component Damage Records for Building Evaluated in Example Application

Component Damage Record D13

Building Name: Concrete Shear Wall Building		Project ID: ATC 43 Example	Prepared by: ATC
Location Within Building: Floor: 1 st /2 nd Column Line: E Component Type:			Date: 24-Sep-97
Sketch and Description of Damage:			



Legend:

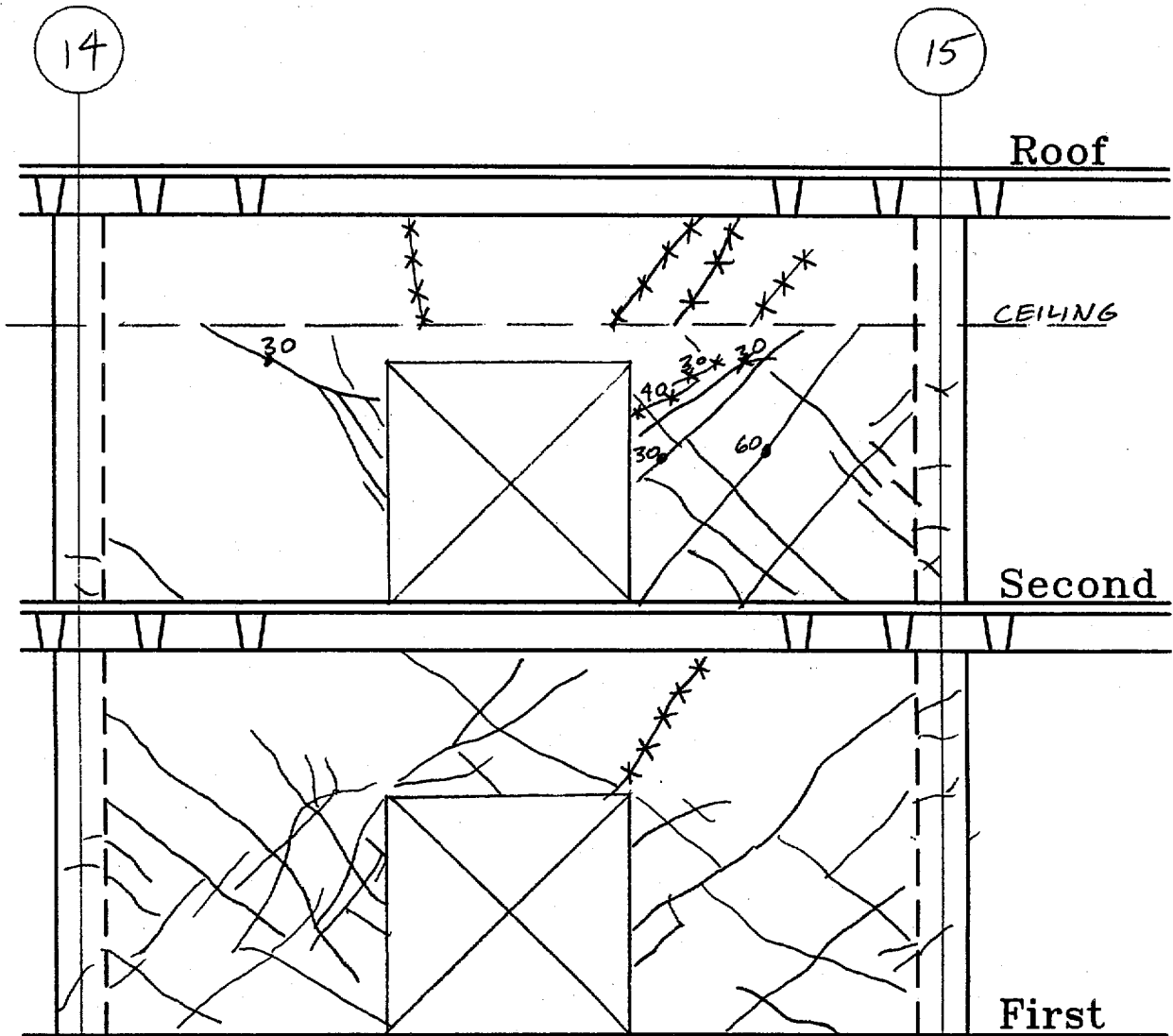
- | | | | |
|--|-------------------------------------|--|----------------|
| | Crack | | Spall |
| | Crack Width in Mil (0.001 Inch) | | Not Accessible |
| | Crack Previously Filled with Epoxy | | Partition |
| | Crack at Pre-existing Surface Patch | | |

Component Damage Records for Building Evaluated in Example Application

Component Damage Record D14

Building Name: Concrete Shear Wall Building	Project ID: ATC 43 Example	Prepared by: ATC
Location Within Building: Floor: 1 st /2 nd Column Line: E Component Type:		Date: 24-Sep-97

Sketch and Description of Damage:



Legend:

	Crack		Spall
	Crack Width in Mils (0.001 Inch)		Not Accessible
	Crack Previously Filled with Epoxy		Partition
	Crack at Pre-existing Surface Patch		

Component Damage Records for Building Evaluated in Example Application

Component Damage Record D15

Building Name:

Concrete Shear Wall Building

Project ID:

ATC 43 Example

Prepared by:

ATC

Location Within Building:

Floor: 1st/2nd

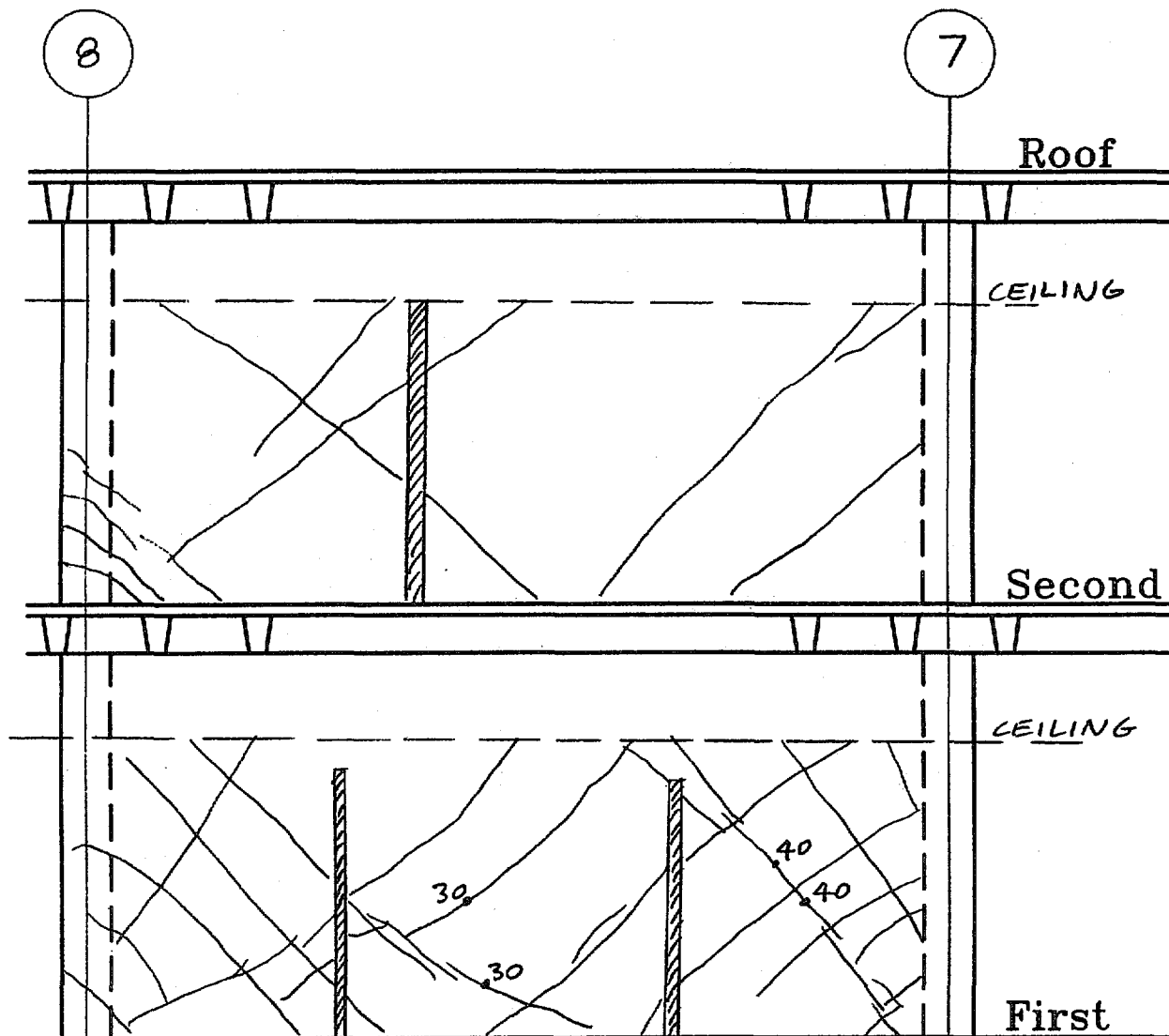
Column Line: G

Component Type:

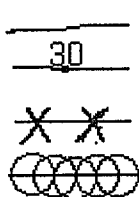
Date:

24-Sep-97

Sketch and Description of Damage:



Legend:

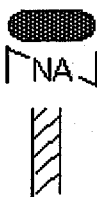


Crack

Crack Width in Mils (0.001 Inch)

Crack Previously Filled with Epoxy

Crack at Pre-existing Surface Patch



Spall

Not Accessible

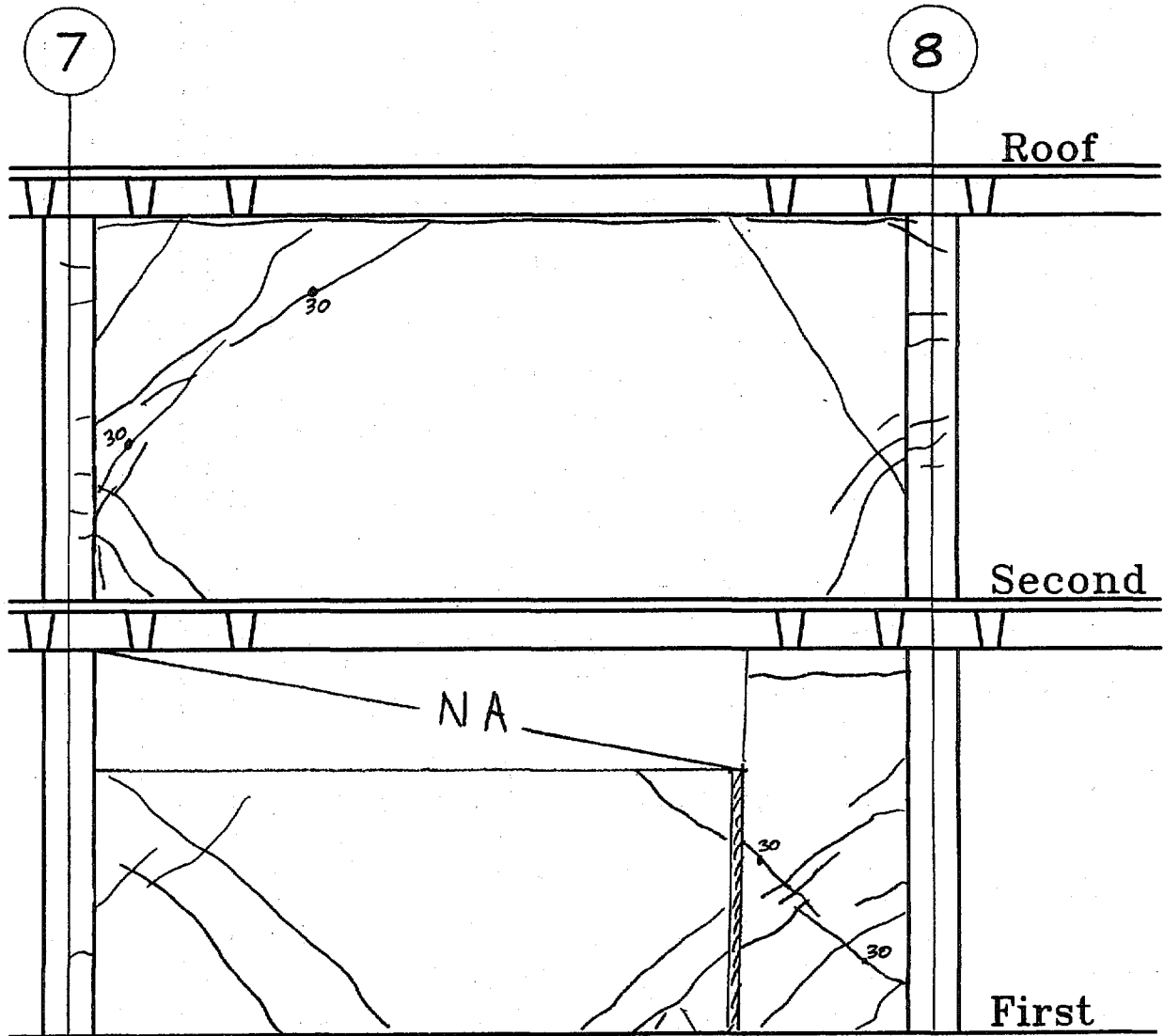
Partition

Component Damage Record D16		
Building Name: Concrete Shear Wall Building	Project ID: ATC 43 Example	Prepared by: ATC
Location Within Building:		Date: 24-Sep-97
Floor: 1 st /2 nd	Column Line: G	Component Type:
Sketch and Description of Damage:		
Legend: <div style="display: flex; justify-content: space-between;"> <div> <p>— 30 — Crack Width in Mills (0.001 Inch)</p> <p>X X Crack Previously Filled with Epoxy</p> <p>⊗ Crack at Pre-existing Surface Patch</p> </div> <div> <p> Spall</p> <p> Not Accessible</p> <p> Partition</p> </div> </div>		

Component Damage Records for Building Evaluated in Example Application

Component Damage Record D17

Building Name: Concrete Shear Wall Building		Project ID: ATC 43 Example	Prepared by: ATC
Location Within Building: Floor: 1 st /2 nd Column Line: M Component Type:			Date: 24-Sep-97
Sketch and Description of Damage:			



Legend:

- | | | | |
|--|-------------------------------------|--|----------------|
| | Crack | | Spall |
| | Crack Width in Mills (0.001 Inch) | | Not Accessible |
| | Crack Previously Filled with Epoxy | | Partition |
| | Crack at Pre-existing Surface Patch | | |

Component Damage Records for Building Evaluated in Example Application

Component Damage Record D18

Building Name:

Concrete Shear Wall Building

Project ID:

ATC 43 Example

Prepared by:

ATC

Location Within Building:

Floor: 1st/2nd

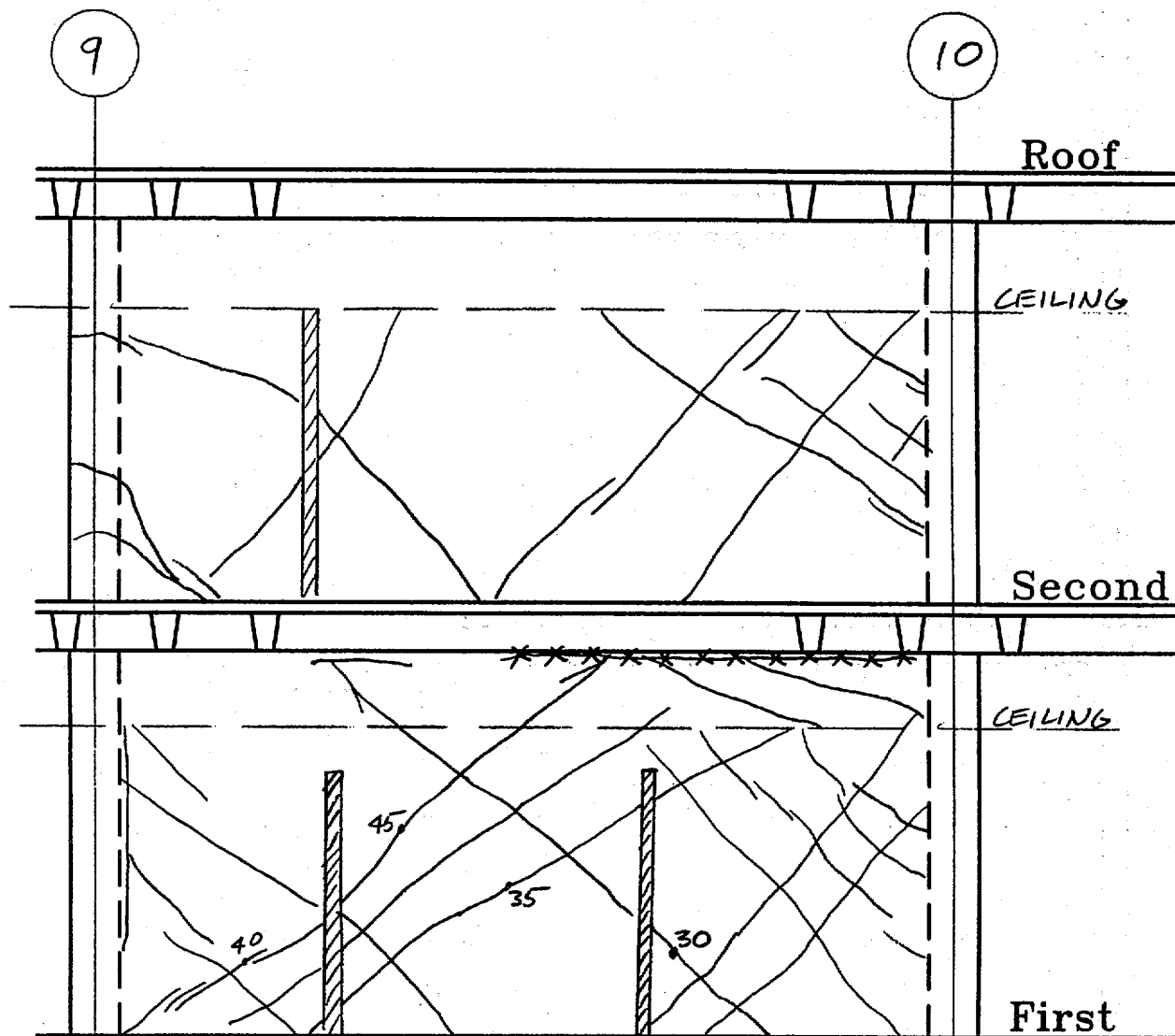
Column Line: M

Component Type:

Date:

24-Sep-97

Sketch and Description of Damage:



Legend:

30

Crack

Crack Width in Mils (0.001 Inch)

X X

Crack Previously Filled with Epoxy

○ ○ ○ ○

Crack at Pre-existing Surface Patch

NA

Spall

NA

Not Accessible

|||

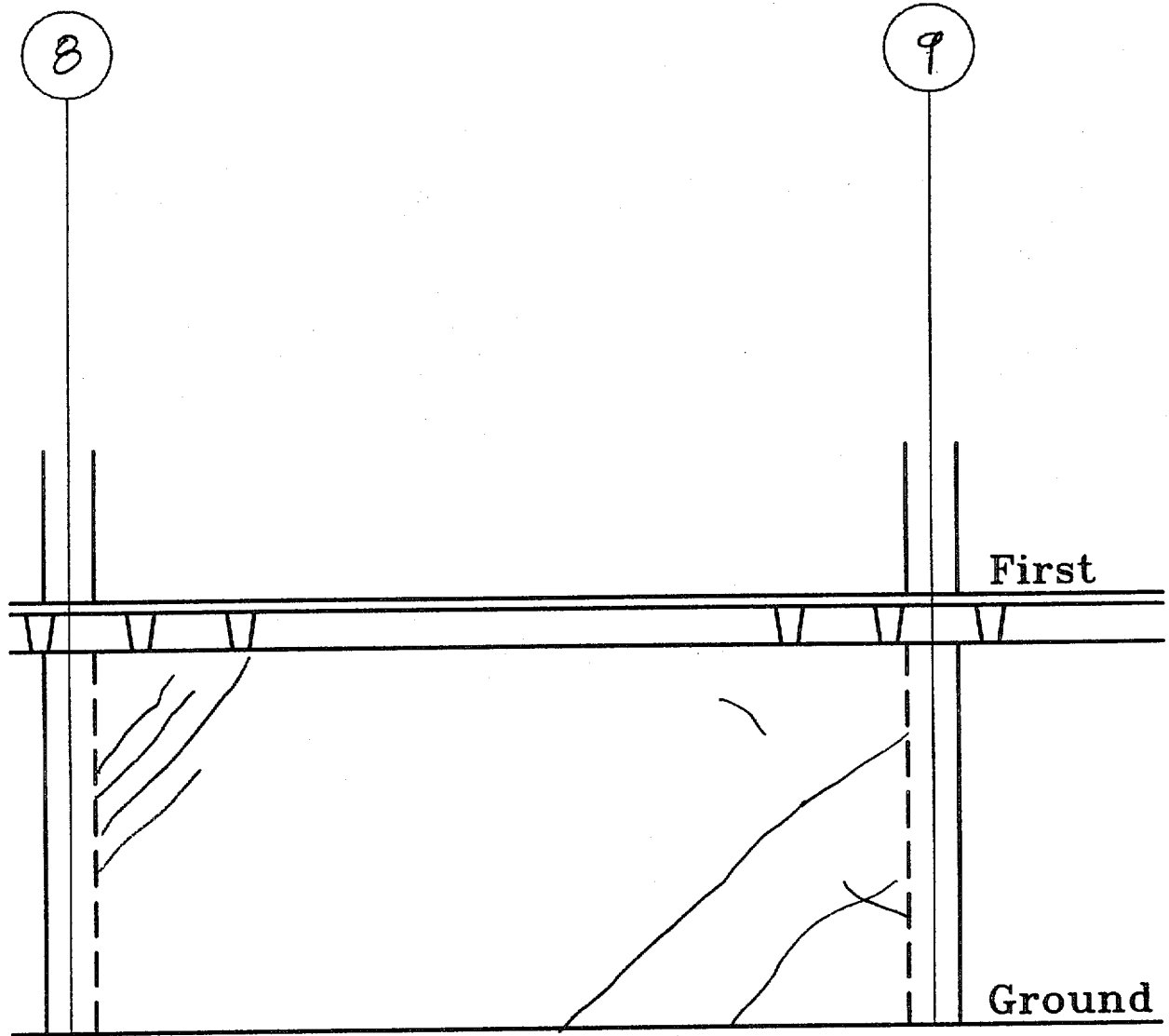
Partition

Component Damage Records for Building Evaluated in Example Application

Component Damage Record D19

Building Name: Concrete Shear Wall Building		Project ID: ATC 43 Example	Prepared by: ATC
Location Within Building: Floor: 1 st /2 nd Column Line: M Component Type:			Date: 24-Sep-97

Sketch and Description of Damage:



Legend:

- | | | | |
|--|-------------------------------------|--|----------------|
| | Crack | | Spall |
| | Crack Width in Mils (0.001 Inch) | | Not Accessible |
| | Crack Previously Filled with Epoxy | | Partition |
| | Crack at Pre-existing Surface Patch | | |

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Applied Technology Council Projects And Report Information

One of the primary purposes of Applied Technology Council is to develop resource documents that translate and summarize useful information to practicing engineers. This includes the development of guidelines and manuals, as well as the development of research recommendations for specific areas determined by the profession. ATC is not a code development organization, although several of the ATC project reports serve as resource documents for the development of codes, standards and specifications.

Applied Technology Council conducts projects that meet the following criteria:

1. The primary audience or benefactor is the design practitioner in structural engineering.
2. A cross section or consensus of engineering opinion is required to be obtained and presented by a neutral source.
3. The project fosters the advancement of structural engineering practice.

A brief description of several major completed projects and reports is given in the following section. Funding for projects is obtained from government agencies and tax-deductible contributions from the private sector.

ATC-1: This project resulted in five papers that were published as part of *Building Practices for Disaster Mitigation, Building Science Series 46*, proceedings of a workshop sponsored by the National Science Foundation (NSF) and the National Bureau of Standards (NBS). Available through the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22151, as NTIS report No. COM-73-50188.

ATC-2: The report, *An Evaluation of a Response Spectrum Approach to Seismic Design of Buildings*, was funded by NSF and NBS and was conducted as part of the Cooperative Federal Program in Building Practices for Disaster Mitigation. Available through the ATC office. (Published 1974, 270 Pages)

ABSTRACT: This study evaluated the applicability and cost of the response spectrum approach to seismic

analysis and design that was proposed by various segments of the engineering profession. Specific building designs, design procedures and parameter values were evaluated for future application. Eleven existing buildings of varying dimensions were redesigned according to the procedures.

ATC-3: The report, *Tentative Provisions for the Development of Seismic Regulations for Buildings* (ATC-3-06), was funded by NSF and NBS. The second printing of this report, which includes proposed amendments, is available through the ATC office. (Published 1978, amended 1982, 505 pages plus proposed amendments)

ABSTRACT: The tentative provisions in this document represent the results of a concerted effort by a multi-disciplinary team of 85 nationally recognized experts in earthquake engineering. The provisions serve as the basis for the seismic provisions of the 1988 *Uniform Building Code* and the 1988 and subsequent issues of the *NEHRP Recommended Provisions for the Development of Seismic Regulation for New Buildings*. The second printing of this document contains proposed amendments prepared by a joint committee of the Building Seismic Safety Council (BSSC) and the NBS.

ATC-3-2: The project, *Comparative Test Designs of Buildings Using ATC-3-06 Tentative Provisions*, was funded by NSF. The project consisted of a study to develop and plan a program for making comparative test designs of the ATC-3-06 Tentative Provisions. The project report was written to be used by the Building Seismic Safety Council in its refinement of the ATC-3-06 Tentative Provisions.

ATC-3-4: The report, *Redesign of Three Multistory Buildings: A Comparison Using ATC-3-06 and 1982 Uniform Building Code Design Provisions*, was published under a grant from NSF. Available through the ATC office. (Published 1984, 112 pages)

ABSTRACT: This report evaluates the cost and technical impact of using the 1978 ATC-3-06 report, *Tentative Provisions for the Development of Seismic Regulations for Buildings*, as amended by a joint

committee of the Building Seismic Safety Council and the National Bureau of Standards in 1982. The evaluations are based on studies of three existing California buildings redesigned in accordance with the ATC-3-06 Tentative Provisions and the 1982 *Uniform Building Code*. Included in the report are recommendations to code implementing bodies.

ATC-3-5: This project, Assistance for First Phase of ATC-3-06 Trial Design Program Being Conducted by the Building Seismic Safety Council, was funded by the Building Seismic Safety Council to provide the services of the ATC Senior Consultant and other ATC personnel to assist the BSSC in the conduct of the first phase of its Trial Design Program. The first phase provided for trial designs conducted for buildings in Los Angeles, Seattle, Phoenix, and Memphis.

ATC-3-6: This project, Assistance for Second Phase of ATC-3-06 Trial Design Program Being Conducted by the Building Seismic Safety Council, was funded by the Building Seismic Safety Council to provide the services of the ATC Senior Consultant and other ATC personnel to assist the BSSC in the conduct of the second phase of its Trial Design Program. The second phase provided for trial designs conducted for buildings in New York, Chicago, St. Louis, Charleston, and Fort Worth.

ATC-4: The report, *A Methodology for Seismic Design and Construction of Single-Family Dwellings*, was published under a contract with the Department of Housing and Urban Development (HUD). Available through the ATC office. (Published 1976, 576 pages)

ABSTRACT: This report presents the results of an in-depth effort to develop design and construction details for single-family residences that minimize the potential economic loss and life-loss risk associated with earthquakes. The report: (1) discusses the ways structures behave when subjected to seismic forces, (2) sets forth suggested design criteria for conventional layouts of dwellings constructed with conventional materials, (3) presents construction details that do not require the designer to perform analytical calculations, (4) suggests procedures for efficient plan-checking, and (5) presents recommendations including details and schedules for use in the field by construction personnel and building inspectors.

ATC-4-1: The report, *The Home Builders Guide for Earthquake Design*, was published under a contract with HUD. Available through the ATC office. (Published 1980, 57 pages)

ABSTRACT: This report is an abridged version of the ATC-4 report. The concise, easily understood text of the Guide is supplemented with illustrations and 46 construction details. The details are provided to ensure that houses contain structural features that are properly positioned, dimensioned and constructed to resist earthquake forces. A brief description is included on how earthquake forces impact on houses and some precautionary constraints are given with respect to site selection and architectural designs.

ATC-5: The report, *Guidelines for Seismic Design and Construction of Single-Story Masonry Dwellings in Seismic Zone 2*, was developed under a contract with HUD. Available through the ATC office. (Published 1986, 38 pages)

ABSTRACT: The report offers a concise methodology for the earthquake design and construction of single-story masonry dwellings in Seismic Zone 2 of the United States, as defined by the 1973 *Uniform Building Code*. The Guidelines are based in part on shaking table tests of masonry construction conducted at the University of California at Berkeley Earthquake Engineering Research Center. The report is written in simple language and includes basic house plans, wall evaluations, detail drawings, and material specifications.

ATC-6: The report, *Seismic Design Guidelines for Highway Bridges*, was published under a contract with the Federal Highway Administration (FHWA). Available through the ATC office. (Published 1981, 210 pages)

ABSTRACT: The Guidelines are the recommendations of a team of sixteen nationally recognized experts that included consulting engineers, academics, state and federal agency representatives from throughout the United States. The Guidelines embody several new concepts that were significant departures from then existing design provisions. Included in the Guidelines are an extensive commentary, an example demonstrating the use of the

Guidelines, and summary reports on 21 bridges redesigned in accordance with the Guidelines.

The guidelines have been adopted by the American Association of Highway and Transportation Officials as a guide specification.

ATC-6-1: The report, *Proceedings of a Workshop on Earthquake Resistance of Highway Bridges*, was published under a grant from NSF. Available through the ATC office. (Published 1979, 625 pages)

ABSTRACT: The report includes 23 state-of-the-art and state-of-practice papers on earthquake resistance of highway bridges. Seven of the twenty-three papers were authored by participants from Japan, New Zealand and Portugal. The Proceedings also contain recommendations for future research that were developed by the 45 workshop participants.

ATC-6-2: The report, *Seismic Retrofitting Guidelines for Highway Bridges*, was published under a contract with FHWA. Available through the ATC office. (Published 1983, 220 pages)

ABSTRACT: The Guidelines are the recommendations of a team of thirteen nationally recognized experts that included consulting engineers, academics, state highway engineers, and federal agency representatives. The Guidelines, applicable for use in all parts of the United States, include a preliminary screening procedure, methods for evaluating an existing bridge in detail, and potential retrofitting measures for the most common seismic deficiencies. Also included are special design requirements for various retrofitting measures.

ATC-7: The report, *Guidelines for the Design of Horizontal Wood Diaphragms*, was published under a grant from NSF. Available through the ATC office. (Published 1981, 190 pages)

ABSTRACT: Guidelines are presented for designing roof and floor systems so these can function as horizontal diaphragms in a lateral force resisting system. Analytical procedures, connection details and design examples are included in the Guidelines.

ATC-7-1: The report, *Proceedings of a Workshop of Design of Horizontal Wood Diaphragms*, was

published under a grant from NSF. Available through the ATC office. (Published 1980, 302 pages)

ABSTRACT: The report includes seven papers on state-of-the-practice and two papers on recent research. Also included are recommendations for future research that were developed by the 35 workshop participants.

ATC-8: This report, *Proceedings of a Workshop on the Design of Prefabricated Concrete Buildings for Earthquake Loads*, was funded by NSF. Available through the ATC office. (Published 1981, 400 pages)

ABSTRACT: The report includes eighteen state-of-the-art papers and six summary papers. Also included are recommendations for future research that were developed by the 43 workshop participants.

ATC-9: The report, *An Evaluation of the Imperial County Services Building Earthquake Response and Associated Damage*, was published under a grant from NSF. Available through the ATC office. (Published 1984, 231 pages)

ABSTRACT: The report presents the results of an in-depth evaluation of the Imperial County Services Building, a 6-story reinforced concrete frame and shear wall building severely damaged by the October 15, 1979 Imperial Valley, California, earthquake. The report contains a review and evaluation of earthquake damage to the building; a review and evaluation of the seismic design; a comparison of the requirements of various building codes as they relate to the building; and conclusions and recommendations pertaining to future building code provisions and future research needs.

ATC-10: This report, *An Investigation of the Correlation Between Earthquake Ground Motion and Building Performance*, was funded by the U.S. Geological Survey (USGS). Available through the ATC office. (Published 1982, 114 pages)

ABSTRACT: The report contains an in-depth analytical evaluation of the ultimate or limit capacity of selected representative building framing types, a discussion of the factors affecting the seismic performance of buildings, and a sum-

mary and comparison of seismic design and seismic risk parameters currently in widespread use.

ATC-10-1: This report, *Critical Aspects of Earthquake Ground Motion and Building Damage Potential*, was co-funded by the USGS and the NSF. Available through the ATC office. (Published 1984, 259 pages)

ABSTRACT: This document contains 19 state-of-the-art papers on ground motion, structural response, and structural design issues presented by prominent engineers and earth scientists in an ATC seminar. The main theme of the papers is to identify the critical aspects of ground motion and building performance that currently are not being considered in building design. The report also contains conclusions and recommendations of working groups convened after the Seminar.

ATC-11: The report, *Seismic Resistance of Reinforced Concrete Shear Walls and Frame Joints: Implications of Recent Research for Design Engineers*, was published under a grant from NSF. Available through the ATC office. (Published 1983, 184 pages)

ABSTRACT: This document presents the results of an in-depth review and synthesis of research reports pertaining to cyclic loading of reinforced concrete shear walls and cyclic loading of joint reinforced concrete frames. More than 125 research reports published since 1971 are reviewed and evaluated in this report. The preparation of the report included a consensus process involving numerous experienced design professionals from throughout the United States. The report contains reviews of current and past design practices, summaries of research developments, and in-depth discussions of design implications of recent research results.

ATC-12: This report, *Comparison of United States and New Zealand Seismic Design Practices for Highway Bridges*, was published under a grant from NSF. Available through the ATC office. (Published 1982, 270 pages)

ABSTRACT: The report contains summaries of all aspects and innovative design procedures used in New Zealand as well as comparison of United States and New Zealand design practice. Also included are research recommendations developed

at a 3-day workshop in New Zealand attended by 16 U.S. and 35 New Zealand bridge design engineers and researchers.

ATC-12-1: This report, *Proceedings of Second Joint U.S.-New Zealand Workshop on Seismic Resistance of Highway Bridges*, was published under a grant from NSF. Available through the ATC office. (Published 1986, 272 pages)

ABSTRACT: This report contains written versions of the papers presented at this 1985 Workshop as well as a list and prioritization of workshop recommendations. Included are summaries of research projects being conducted in both countries as well as state-of-the-practice papers on various aspects of design practice. Topics discussed include bridge design philosophy and loadings; design of columns, footings, piles, abutments and retaining structures; geotechnical aspects of foundation design; seismic analysis techniques; seismic retrofitting; case studies using base isolation; strong-motion data acquisition and interpretation; and testing of bridge components and bridge systems.

ATC-13: The report, *Earthquake Damage Evaluation Data for California*, was developed under a contract with the Federal Emergency Management Agency (FEMA). Available through the ATC office. (Published 1985, 492 pages)

ABSTRACT: This report presents expert-opinion earthquake damage and loss estimates for industrial, commercial, residential, utility and transportation facilities in California. Included are damage probability matrices for 78 classes of structures and estimates of time required to restore damaged facilities to pre-earthquake usability. The report also describes the inventory information essential for estimating economic losses and the methodology used to develop loss estimates on a regional basis.

ATC-14: The report, *Evaluating the Seismic Resistance of Existing Buildings*, was developed under a grant from the NSF. Available through the ATC office. (Published 1987, 370 pages)

ABSTRACT: This report, written for practicing structural engineers, describes a methodology for performing preliminary and detailed building seis-

mic evaluations. The report contains a state-of-practice review; seismic loading criteria; data collection procedures; a detailed description of the building classification system; preliminary and detailed analysis procedures; and example case studies, including nonstructural considerations.

ATC-15: The report, *Comparison of Seismic Design Practices in the United States and Japan*, was published under a grant from NSF. Available through the ATC office. (Published 1984, 317 pages)

ABSTRACT: The report contains detailed technical papers describing design practices in the United States and Japan as well as recommendations emanating from a joint U.S.-Japan workshop held in Hawaii in March, 1984. Included are detailed descriptions of new seismic design methods for buildings in Japan and case studies of the design of specific buildings (in both countries). The report also contains an overview of the history and objectives of the Japan Structural Consultants Association.

ATC-15-1: The report, *Proceedings of Second U.S.-Japan Workshop on Improvement of Building Seismic Design and Construction Practices*, was published under a grant from NSF. Available through the ATC office. (Published 1987, 412 pages)

ABSTRACT: This report contains 23 technical papers presented at this San Francisco workshop in August, 1986, by practitioners and researchers from the U.S. and Japan. Included are state-of-the-practice papers and case studies of actual building designs and information on regulatory, contractual, and licensing issues.

ATC-15-2: The report, *Proceedings of Third U.S.-Japan Workshop on Improvement of Building Structural Design and Construction Practices*, was published jointly by ATC and the Japan Structural Consultants Association. Available through the ATC office. (Published 1989, 358 pages)

ABSTRACT: This report contains 21 technical papers presented at this Tokyo, Japan, workshop in July, 1988, by practitioners and researchers from the U.S., Japan, China, and New Zealand. Included are state-of-the-practice papers on various topics,

including braced steel frame buildings, beam-column joints in reinforced concrete buildings, summaries of comparative U. S. and Japanese design, and base isolation and passive energy dissipation devices.

ATC-15-3: The report, *Proceedings of Fourth U.S.-Japan Workshop on Improvement of Building Structural Design and Construction Practices*, was published jointly by ATC and the Japan Structural Consultants Association. Available through the ATC office. (Published 1992, 484 pages)

ABSTRACT: This report contains 22 technical papers presented at this Kailua-Kona, Hawaii, workshop in August, 1990, by practitioners and researchers from the United States, Japan, and Peru. Included are papers on postearthquake building damage assessment; acceptable earth-quake damage; repair and retrofit of earthquake damaged buildings; base-isolated buildings, including Architectural Institute of Japan recommendations for design; active damping systems; wind-resistant design; and summaries of working group conclusions and recommendations.

ATC-15-4: The report, *Proceedings of Fifth U.S.-Japan Workshop on Improvement of Building Structural Design and Construction Practices*, was published jointly by ATC and the Japan Structural Consultants Association. Available through the ATC office. (Published 1994, 360 pages)

ABSTRACT: This report contains 20 technical papers presented at this San Diego, California workshop in September, 1992. Included are papers on performance goals/acceptable damage in seismic design; seismic design procedures and case studies; construction influences on design; seismic isolation and passive energy dissipation; design of irregular structures; seismic evaluation, repair and upgrading; quality control for design and construction; and summaries of working group discussions and recommendations.

ATC-16: This project, Development of a 5-Year Plan for Reducing the Earthquake Hazards Posed by Existing Nonfederal Buildings, was funded by FEMA and was conducted by a joint venture of ATC, the Building Seismic Safety Council and the Earthquake Engineering

Research Institute. The project involved a workshop in Phoenix, Arizona, where approximately 50 earthquake specialists met to identify the major tasks and goals for reducing the earthquake hazards posed by existing non-federal buildings nationwide. The plan was developed on the basis of nine issue papers presented at the workshop and workshop working group discussions. The Workshop Proceedings and Five-Year Plan are available through the Federal Emergency Management Agency, 500 "C" Street, S.W., Washington, DC 20472.

ATC-17: This report, *Proceedings of a Seminar and Workshop on Base Isolation and Passive Energy Dissipation*, was published under a grant from NSF. Available through the ATC office. (Published 1986, 478 pages)

ABSTRACT: The report contains 42 papers describing the state-of-the-art and state-of-the-practice in base-isolation and passive energy-dissipation technology. Included are papers describing case studies in the United States, applications and developments worldwide, recent innovations in technology development, and structural and ground motion issues. Also included is a proposed 5-year research agenda that addresses the following specific issues: (1) strong ground motion; (2) design criteria; (3) materials, quality control, and long-term reliability; (4) life cycle cost methodology; and (5) system response.

ATC-17-1: This report, *Proceedings of a Seminar on Seismic Isolation, Passive Energy Dissipation and Active Control*, was published under a grant from NSF. Available through the ATC office. (Published 1993, 841 pages)

ABSTRACT: The 2-volume report documents 70 technical papers presented during a two-day seminar in San Francisco in early 1993. Included are invited theme papers and competitively selected papers on issues related to seismic isolation systems, passive energy dissipation systems, active control systems and hybrid systems.

ATC-18: The report, *Seismic Design Criteria for Bridges and Other Highway Structures: Current and Future*, was published under a contract from the Multidisciplinary Center for Earthquake Engineering Research (formerly NCEER), with funding from the

Federal Highway Administration. Available through the ATC office. (Published 1997, 152 pages)

ABSTRACT: This report documents the findings of a 4-year project to review and assess current seismic design criteria for new highway construction. The report addresses performance criteria, importance classification, definitions of seismic hazard for areas where damaging earthquakes have longer return periods, design ground motion, duration effects, site effects, structural response modification factors, ductility demand, design procedures, foundation and abutment modeling, soil-structure interaction, seat widths, joint details and detailing reinforced concrete for limited ductility in areas with low-to-moderate seismic activity. The report also provides lengthy discussion on future directions for code development and recommended research and development topics.

ATC-19: The report, *Structural Response Modification Factors* was funded by NSF and NCEER. Available through the ATC office. (Published 1995, 70 pages)

ABSTRACT: This report addresses structural response modification factors (R factors), which are used to reduce the seismic forces associated with elastic response to obtain design forces. The report documents the basis for current R values, how R factors are used for seismic design in other countries, a rational means for decomposing R into key components, a framework (and methods) for evaluating the key components of R, and the research necessary to improve the reliability of engineered construction designed using R factors.

ATC-20: The report, *Procedures for Postearthquake Safety Evaluation of Buildings*, was developed under a contract from the California Office of Emergency Services (OES), California Office of Statewide Health Planning and Development (OSHPD) and FEMA. Available through the ATC office (Published 1989, 152 pages)

ABSTRACT: This report provides procedures and guidelines for making on-the-spot evaluations and decisions regarding continued use and occupancy of earthquake damaged buildings. Written specifically for volunteer structural engineers and building inspectors, the report includes rapid and detailed

evaluation procedures for inspecting buildings and posting them as "inspected" (apparently safe), "limited entry" or "unsafe". Also included are special procedures for evaluation of essential buildings (e.g., hospitals), and evaluation procedures for non-structural elements, and geotechnical hazards.

ATC-20-1: The report, *Field Manual: Postearthquake Safety Evaluation of Buildings*, was developed under a contract from OES and OSHPD. Available through the ATC office (Published 1989, 114 pages)

ABSTRACT: This report, a companion Field Manual for the ATC-20 report, summarizes the postearthquake safety evaluation procedures in brief concise format designed for ease of use in the field.

ATC-20-2: The report, *Addendum to the ATC-20 Postearthquake Building Safety Procedures* was published under a grant from the NSF and funded by the USGS. Available through the ATC office. (Published 1995, 94 pages)

ABSTRACT: This report provides updated assessment forms, placards, and procedures that are based on an in-depth review and evaluation of the widespread application of the ATC-20 procedures following five earthquakes occurring since the initial release of the ATC-20 report in 1989.

ATC-20-3: The report, *Case Studies in Rapid Postearthquake Safety Evaluation of Buildings*, was funded by ATC and R. P. Gallagher Associates. Available through the ATC office. (Published 1996, 295 pages)

ABSTRACT: This report contains 53 case studies using the ATC-20 Rapid Evaluation procedure. Each case study is illustrated with photos and describes how a building was inspected and evaluated for life safety, and includes a completed safety assessment form and placard. The report is intended to be used as a training and reference manual for building officials, building inspectors, civil and structural engineers, architects, disaster workers, and others who may be asked to perform safety evaluations after an earthquake.

ATC-20-T: The report, *Postearthquake Safety Evaluation of Buildings Training Manual* was developed under

a contract with FEMA. Available through the ATC office. (Published 1993, 177 pages; 160 slides)

ABSTRACT: This training manual is intended to facilitate the presentation of the contents of the ATC-20 and ATC-20-1. The training materials consist of 160 slides of photographs, schematic drawings and textual information and a companion training presentation narrative coordinated with the slides. Topics covered include: posting system; evaluation procedures; structural basics; wood frame, masonry, concrete, and steel frame structures; nonstructural elements; geotechnical hazards; hazardous materials; and field safety.

ATC-21: The report, *Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook*, was developed under a contract from FEMA. Available through the ATC office. (Published 1988, 185 pages)

ABSTRACT: This report describes a rapid visual screening procedure for identifying those buildings that might pose serious risk of loss of life and injury, or of severe curtailment of community services, in case of a damaging earthquake. The screening procedure utilizes a methodology based on a "sidewalk survey" approach that involves identification of the primary structural load resisting system and building materials, and assignment of a basic structural hazards score and performance modification factors based on observed building characteristics. Application of the methodology identifies those buildings that are potentially hazardous and should be analyzed in more detail by a professional engineer experienced in seismic design.

ATC-21-1: The report, *Rapid Visual Screening of Buildings for Potential Seismic Hazards: Supporting Documentation*, was developed under a contract from FEMA. Available through the ATC office. (Published 1988, 137 pages)

ABSTRACT: Included in this report are (1) a review and evaluation of existing procedures; (2) a listing of attributes considered ideal for a rapid visual screening procedure; and (3) a technical discussion of the recommended rapid visual screening procedure that is documented in the ATC-21 report.

ATC-21-2: The report, *Earthquake Damaged Buildings: An Overview of Heavy Debris and Victim Extrication*, was developed under a contract from FEMA. (Published 1988, 95 pages)

ABSTRACT: Included in this report, a companion volume to the ATC-21 and ATC-21-1 reports, is state-of-the-art information on (1) the identification of those buildings that might collapse and trap victims in debris or generate debris of such a size that its handling would require special or heavy lifting equipment; (2) guidance in identifying these types of buildings, on the basis of their major exterior features, and (3) the types and life capacities of equipment required to remove the heavy portion of the debris that might result from the collapse of such buildings.

ATC-21-T: The report, *Rapid Visual Screening of Buildings for Potential Seismic Hazards Training Manual* was developed under a contract with FEMA. Available through the ATC office. (Published 1996, 135 pages; 120 slides)

ABSTRACT: This training manual is intended to facilitate the presentation of the contents of the ATC-21 report. The training materials consist of 120 slides and a companion training presentation narrative coordinated with the slides. Topics covered include: description of procedure, building behavior, building types, building scores, occupancy and falling hazards, and implementation.

ATC-22: The report, *A Handbook for Seismic Evaluation of Existing Buildings (Preliminary)*, was developed under a contract from FEMA. Available through the ATC office. (Originally published in 1989; revised by BSSC and published as the *NEHRP Handbook for Seismic Evaluation of Existing Buildings* in 1992, 211 pages)

ABSTRACT: This handbook provides a methodology for seismic evaluation of existing buildings of different types and occupancies in areas of different seismicity throughout the United States. The methodology, which has been field tested in several programs nationwide, utilizes the information and procedures developed for and documented in the ATC-14 report. The handbook includes checklists, diagrams, and sketches designed to assist the user.

ATC-22-1: The report, *Seismic Evaluation of Existing Buildings: Supporting Documentation*, was developed under a contract from FEMA. (Published 1989, 160 pages)

ABSTRACT: Included in this report, a companion volume to the ATC-22 report, are (1) a review and evaluation of existing buildings seismic evaluation methodologies; (2) results from field tests of the ATC-14 methodology; and (3) summaries of evaluations of ATC-14 conducted by the National Center for Earthquake Engineering Research (State University of New York at Buffalo) and the City of San Francisco.

ATC-23A: The report, *General Acute Care Hospital Earthquake Survivability Inventory for California, Part A: Survey Description, Summary of Results, Data Analysis and Interpretation*, was developed under a contract from the Office of Statewide Health Planning and Development (OSHPD), State of California. Available through the ATC office. (Published 1991, 58 pages)

ABSTRACT: This report summarizes results from a seismic survey of 490 California acute care hospitals. Included are a description of the survey procedures and data collected, a summary of the data, and an illustrative discussion of data analysis and interpretation that has been provided to demonstrate potential applications of the ATC-23 database.

ATC-23B: The report, *General Acute Care Hospital Earthquake Survivability Inventory for California, Part B: Raw Data*, is a companion document to the ATC-23A Report and was developed under the above-mentioned contract from OSHPD. Available through the ATC office. (Published 1991, 377 pages)

ABSTRACT: Included in this report are tabulations of raw general site and building data for 490 acute care hospitals in California.

ATC-24: The report, *Guidelines for Seismic Testing of Components of Steel Structures*, was jointly funded by the American Iron and Steel Institute (AISI), American Institute of Steel Construction (AISC), National Center for Earthquake Engineering Research (NCEER), and NSF. Available through the ATC office. (Published 1992, 57 pages)

ABSTRACT: This report provides guidance for most cyclic experiments on components of steel structures for the purpose of consistency in experimental procedures. The report contains recommendations and companion commentary pertaining to loading histories, presentation of test results, and other aspects of experimentation. The recommendations are written specifically for experiments with slow cyclic load application.

ATC-25: The report, *Seismic Vulnerability and Impact of Disruption of Lifelines in the Conterminous United States*, was developed under a contract from FEMA. Available through the ATC office. (Published 1991, 440 pages)

ABSTRACT: Documented in this report is a national overview of lifeline seismic vulnerability and impact of disruption. Lifelines considered include electric systems, water systems, transportation systems, gas and liquid fuel supply systems, and emergency service facilities (hospitals, fire and police stations). Vulnerability estimates and impacts developed are presented in terms of estimated first approximation direct damage losses and indirect economic losses.

ATC-25-1: The report, *A Model Methodology for Assessment of Seismic Vulnerability and Impact of Disruption of Water Supply Systems*, was developed under a contract from FEMA. Available through the ATC office. (Published 1992, 147 pages)

ABSTRACT: This report contains a practical methodology for the detailed assessment of seismic vulnerability and impact of disruption of water supply systems. The methodology has been designed for use by water system operators. Application of the methodology enables the user to develop estimates of direct damage to system components and the time required to restore damaged facilities to pre-earthquake usability. Suggested measures for mitigation of seismic hazards are also provided.

ATC-28: The report, *Development of Recommended Guidelines for Seismic Strengthening of Existing Buildings, Phase I: Issues Identification and Resolution*, was developed under a contract with FEMA. Available through the ATC office. (Published 1992, 150 pages)

ABSTRACT: This report identifies and provides resolutions for issues that will affect the development of guidelines for the seismic strengthening of existing buildings. Issues addressed include: implementation and format, coordination with other efforts, legal and political, social, economic, historic buildings, research and technology, seismicity and mapping, engineering philosophy and goals, issues related to the development of specific provisions, and nonstructural element issues.

ATC-29: The report, *Proceedings of a Seminar and Workshop on Seismic Design and Performance of Equipment and Nonstructural Elements in Buildings and Industrial Structures*, was developed under a grant from NCEER and NSF. Available through the ATC office. (Published 1992, 470 pages)

ABSTRACT: These Proceedings contain 35 papers describing state-of-the-art technical information pertaining to the seismic design and performance of equipment and nonstructural elements in buildings and industrial structures. The papers were presented at a seminar in Irvine, California in 1990. Included are papers describing current practice, codes and regulations; earthquake performance; analytical and experimental investigations; development of new seismic qualification methods; and research, practice, and code development needs for specific elements and systems. The report also includes a summary of a proposed 5-year research agenda for NCEER.

ATC-29-1: The report, *Proceedings Of Seminar On Seismic Design, Retrofit, And Performance Of Non-structural Components*, was developed under a grant from NCEER and NSF. Available through the ATC office. (Published 1998, 518 pages)

ABSTRACT: These Proceedings contain 38 papers presenting current research, practice, and informed thinking pertinent to seismic design, retrofit, and performance of nonstructural components. The papers were presented at a seminar in San Francisco, California, in 1998. Included are papers describing observed performance in recent earthquakes; seismic design codes, standards, and procedures for commercial and institutional buildings; seismic design issues relating to industrial and hazardous material facilities; design, analysis, and test-

ing; and seismic evaluation and rehabilitation of conventional and essential facilities, including hospitals.

ATC-30: The report, *Proceedings of Workshop for Utilization of Research on Engineering and Socioeconomic Aspects of 1985 Chile and Mexico Earthquakes*, was developed under a grant from the NSF. Available through the ATC office. (Published 1991, 113 pages)

ABSTRACT: This report documents the findings of a 1990 technology transfer workshop in San Diego, California, co-sponsored by ATC and the Earthquake Engineering Research Institute. Included in the report are invited papers and working group recommendations on geotechnical issues, structural response issues, architectural and urban design considerations, emergency response planning, search and rescue, and reconstruction policy issues.

ATC-31: The report, *Evaluation of the Performance of Seismically Retrofitted Buildings*, was developed under a contract from the National Institute of Standards and Technology (NIST, formerly NBS) and funded by the USGS. Available through the ATC office. (Published 1992, 75 pages)

ABSTRACT: This report summarizes the results from an investigation of the effectiveness of 229 seismically retrofitted buildings, primarily unreinforced masonry and concrete tilt-up buildings. All buildings were located in the areas affected by the 1987 Whittier Narrows, California, and 1989 Loma Prieta, California, earthquakes.

ATC-32: The report, *Improved Seismic Design Criteria for California Bridges: Provisional Recommendations*, was funded by the California Department of Transportation (Caltrans). Available through the ATC office. (Published 1996, 215 Pages)

ABSTRACT: This report provides recommended revisions to the current *Caltrans Bridge Design Specifications* (BDS) pertaining to seismic loading, structural response analysis, and component design. Special attention is given to design issues related to reinforced concrete components, steel components, foundations, and conventional bearings. The recommendations are based on recent research in the field of bridge seismic design and the performance

of Caltrans-designed bridges in the 1989 Loma Prieta and other recent California earthquakes.

ATC-34: The report, *A Critical Review of Current Approaches to Earthquake Resistant Design*, was developed under a grant from NCEER and NSF. Available through the ATC office. (Published, 1995, 94 pages)

ABSTRACT. This report documents the history of U. S. codes and standards of practice, focusing primarily on the strengths and deficiencies of current code approaches. Issues addressed include: seismic hazard analysis, earthquake collateral hazards, performance objectives, redundancy and configuration, response modification factors (*R* factors), simplified analysis procedures, modeling of structural components, foundation design, nonstructural component design, and risk and reliability. The report also identifies goals that a new seismic code should achieve.

ATC-35: This report, *Enhancing the Transfer of U.S. Geological Survey Research Results into Engineering Practice* was developed under a contract with the USGS. Available through the ATC office. (Published 1996, 120 pages)

ABSTRACT: The report provides a program of recommended "technology transfer" activities for the USGS; included are recommendations pertaining to management actions, communications with practicing engineers, and research activities to enhance development and transfer of information that is vital to engineering practice.

ATC-35-1: The report, *Proceedings of Seminar on New Developments in Earthquake Ground Motion Estimation and Implications for Engineering Design Practice*, was developed under a cooperative agreement with USGS. Available through the ATC office. (Published 1994, 478 pages)

ABSTRACT: These Proceedings contain 22 technical papers describing state-of-the-art information on regional earthquake risk (focused on five specific regions--California, Pacific Northwest, Central United States, and northeastern North America); new techniques for estimating strong ground motions as a function of earthquake source, travel path, and site parameters; and new developments

specifically applicable to geotechnical engineering and the seismic design of buildings and bridges.

ATC-37: The report, *Review of Seismic Research Results on Existing Buildings*, was developed in conjunction with the Structural Engineers Association of California and California Universities for Research in Earthquake Engineering under a contract from the California Seismic Safety Commission (SSC). Available through the Seismic Safety Commission as Report SSC 94-03. (Published, 1994, 492 pages)

ABSTRACT. This report describes the state of knowledge of the earthquake performance of nonductile concrete frame, shear wall, and infilled buildings. Included are summaries of 90 recent research efforts with key results and conclusions in a simple, easy-to-access format written for practicing design professionals.

ATC-40: The report, *Seismic Evaluation and Retrofit of Concrete Buildings*, was developed under a contract from the California Seismic Safety Commission. Available through the ATC office. (Published, 1996, 612 pages)

ABSTRACT. This 2-volume report provides a state-of-the-art methodology for the seismic evaluation and retrofit of concrete buildings. Specific guidance is provided on the following topics: performance objectives; seismic hazard; determination of deficiencies; retrofit strategies; quality assurance procedures; nonlinear static analysis procedures; modeling rules; foundation effects; response limits; and nonstructural components. In 1997 this report received the West-

ern States Seismic Policy Council "Overall Excellence and New Technology Award."

ATC-44: The report, *Hurricane Fran, South Carolina, September 5, 1996: Reconnaissance Report*, is available through the ATC office. (Published 1997, 36 pages.)

ABSTRACT: This report represents ATC's expanded mandate into structural engineering problems arising from wind storms and coastal flooding. It contains information on the causative hurricane; coastal impacts, including storm surge, waves, structural forces and erosion; building codes; observations and interpretations of damage; and lifeline performance. Conclusions address man-made beach nourishment, the effects of missile-like debris, breaches in the sandy barrier islands, and the timing and duration of such investigations.

ATC-R-1: The report, *Cyclic Testing of Narrow Plywood Shear Walls*, was developed with funding from the Henry J. Degenkolb Memorial Endowment Fund of the Applied Technology Council. Available through the ATC office (Published 1995, 64 pages)

ABSTRACT: This report documents ATC's first self-directed research program: a series of static and dynamic tests of narrow plywood wall panels having the standard 3.5-to-1 height-to-width ratio and anchored to the sill plate using typical bolted, 9-inch, 5000-lb. capacity hold-down devices. The report provides a description of the testing program and a summary of results, including comparisons of drift ratios found during testing with those specified in the seismic provisions of the 1991 *Uniform Building Code*.

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